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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/917,344	07/27/2001	In Kwon Jeong	9323.050.00-US	1220
<div>7590 11/27/2007 MCKENNA LONG &amp; ALDRIDGE LLP SONG K. JUNG 1900 K STREET, N.W. WASHINGTON, DC 20006</div>			<div>EXAMINER MACARTHUR, SYLVIA</div>	
			<div>ART UNIT 1792</div>	<div>PAPER NUMBER</div>
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 09/917,344	<b>Applicant(s)</b> JEONG, IN KWON	
	<b>Examiner</b> Sylvia R. MacArthur	<b>Art Unit</b> 1792	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 10 September 2007.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 3-70 is/are pending in the application.
- 4a) Of the above claim(s) 24-60 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 3-23 and 67-70 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 July 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

***Status of Claims***

1. Claims 3-70 are pending, claims 24-60 are withdrawn, and claims 67 and 70 are amended.

***Response to Arguments***

2. Applicant's arguments with respect to claims 3-23 and 67-70 have been considered but are moot in view of the new ground(s) of rejection. The amendment to claims 67 and 70 reciting that the first and second transfer robots are designed to move the objects in both horizontal and vertical directions are necessitated the introduction of the prior art of Kakizaki et al (US 5,387,265). Recall the prior art of Sakurai et al (US 6,358,131) teaches robots 9 accessing polishing unit 10b and moving vertically to do so according to col. 3 lines 34-38. The prior art of Sommer (US 6,562,184) teaches first and second robots 142/146 and 140/144 accessing polishing unit 106 and moving horizontally to do so. Separately the prior art teaches designing the transfer robots to move in one direction to access the polishing unit. The claimed subject matter merely combined familiar elements (designing a transfer robot to provide vertical and horizontal movement) in order to access the polishing unit and provide transport of the substrate to/from the polishing unit. Furthermore, to provide a robot that combines the teachings of Sakurai et al and Sommer would yield the predictable result of an apparatus that would provide movement of the substrate in a plurality of directions, thus enhancing substrate transport. Thus, it would have been obvious for one ordinary skill in the art at the time of the claimed invention to

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combine the teachings of Sakurai et al and Sommer to provide movement of the substrate in a plurality of directions (vertical and horizontal).

3. Additionally, the prior art of Sakurai et al or Sommer individually could be modified by the teachings of Kakizaki et al (US 5,387,265). The prior art of Kakizaki et al teaches transfer robots, wafer transfer system 4 (lifting block 12, providing vertical movement and wafer handling head 15 providing horizontal movement) and wafer cassette receiving system 22. Cols. 1 lines 25-56 and columns 3 and 4 see also Figs. 3 and 9; describe how both robots provide vertical and horizontal movements of the substrates to/from desired chambers/furnace/cassette stockers. The prior art of Kakizaki et al illustrates/teaches that it is conventional to access chambers/cassette stockers by a plurality of directions in order to accurately and easily transport the wafers. Thus, it would have been obvious for one ordinary skill in the art at the time of the claimed invention to modify the apparatus of Sakurai et al or Sommer with the teachings of Kakizaki et al to provide movement of the substrate in a plurality of directions (vertical and horizontal).

### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. 3, 6-8, 10, 11, 21, 23, and 67-70 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sommer (US 6,562,184) in view of Sakurai et al (US 6,358,131).

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Regarding claim 67: Sommer teaches a polishing unit (106), first/second transfer robots (142/146 and 140/144), see Fig.1.

Sommer fails to teach that the transfer robots recited above are designed to move the objects in both the horizontal and vertical directions. Note Sommer also teaches load cups 166 which move the objects (wafers) vertically as illustrated in Fig. 1 and discussed in col. 7 lines 30-37. Thus Sommer teaches vertical movement of the wafers via the load cups and horizontal movement via the transfer robots, but Sommer fails to teach robots that move in both the vertical and horizontal directions.

Recall the teachings of Sakurai from the previous action wherein transfer robots 9 access polishing unit 10B according to col.4 lines 44-48. Note the direction of movement taught by Sakurai is vertical see Fig.1.

Taken individually the prior art of Sommer or Sakurai et al teaches designing the transfer robots to move in one direction to access the polishing unit. The claimed subject matter merely combined familiar elements (designing a transfer robot to provide vertical and horizontal movement) in order to access the polishing unit and provide transport of the substrate to/from the polishing unit. Furthermore, to provide a robot that combines the teachings of Sommer as modified by Sakurai et al would yield the predictable result of an apparatus that would provide movement of the substrate in a plurality of directions, thus enhancing substrate transport. Thus, it would have been obvious for one ordinary skill in the art at the time of the claimed invention to combine the teachings of Sommer and Sakurai et al to provide movement of the substrate in a plurality of directions (vertical and horizontal).

Regarding claims 68 and 69: Sommer further teaches post-polishing unit (cleaning unit 8).

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Regarding claim 70: Sommer teaches a polishing unit 106, a first/second transfer robots (142/146 and 140/144), see Fig.1, and post-polishing unit (cleaning unit 108).

Regarding claim 3: Sommer teaches a supply units (101, 102) and a supply mechanisms 110,154.

Regarding claim 6: See Fig. 1 illustrates that the robots 110,154 are mobile to travel between supply units 101/102 to/from the robots (142/146 and 140/144).

Regarding claim 7: See Fig.1 illustrates wafer cassettes 126 (object storage housings) near port 116.

Regarding claim 8: Post polishing unit 108 includes object cleaners (cleaning zones 171).

Regarding claims 10 and 11: A conveyor unshown (dual functioning object transfer mechanism) see col.4 lines 30-55.

Regarding claim 21: A first object transfer station (shuttle table 160,162).

Regarding claim 23: Transfer corridor 124 (second transfer station).

6. Claims 4, 5, and 17-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sommer in view of Sakurai et al, as applied to claims 3,6-8,10,11, 21, 23, and 67-70 above, and in further view of Kim et al (US 6,503,365).

The teachings of Sommer as modified by Sakurai et al were discussed above.

The resulting modification fails to teach vertically movement of the cassettes (storage housings) or wafers between each of the polishing units.

Kim et al teaches a multichamber system having compact installing set up. Kim teaches the advantages of using vertical movement in transportation of wafers in and throughout a multichamber processing system. Fig. 5 illustrates the motivation of using vertical movement to

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decrease the footprint of the multichamber system. Thus, it would have been obvious for one of ordinary skill in the art at the time of the claimed invention to use vertical movement as a means of transporting wafers/cassettes in a multichamber system.

7. Claims 9, 12-16, and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sommer in view of Sakurai et al, as applied to claims 3,6-8,10,11, 21, 23, and 67-70 above, and in further view of Wang.

The teachings of Sommer as modified by Sakurai et al were discussed above.

Regarding claims 9 and 22: The resulting modification fails to teach a thickness measurement unit.

Wang teaches an optical dielectric thickness monitor 42 for CMP (a form of cleaning). The motivation to provide a way to monitor the progress of the cleaning process as cited by Wang in col. 3 lines 6-19 is that the monitor of Wang provides timely thickness measurements on the layer being cleaning. Thus, ensuring a more efficient and reliable cleaning process.

It would have been obvious to modify the apparatus of Sommer in view of Sakurai et al with the thickness monitor of Wang to ensure the efficient optimal cleaning result.

Regarding claims 12, 13, and 16: Sakurai et al teaches first and second object cleaners 3, supply mechanism (robot 6) and supply unit 8.

Regarding claims 14 and 15: Sakurai et al fails to teach third and fourth polishing chambers. A plurality of processing chambers is conventional as evidenced by Kim et al. See Kim teaches a plurality of processing chambers wherein at least four of them could be polishing chambers. The motivation to design the processing chambers of Kim et al as specifically polishing chambers is

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well within the design choice of one of ordinary skill in the art. Using the apparatus of Sommer and Sakurai et al it is a matter of duplication of parts which was held to have been obvious by In re Harza. Thus, it would have been obvious for one of ordinary skill in the art at the time of the claimed invention to design the apparatus of Sakari with more polishing chambers with the same footprint using the suggestion of Kim et al to build the chambers vertically upon one another rather than the convention adjacent to in the horizontal direction. Increasing the number of chambers increases the throughput of the overall system which is an advantage sought after in the manufacturing of semiconductors.

### *Conclusion*

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sylvia R. MacArthur whose telephone number is 571-272-1438.



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The examiner can normally be reached on M-Th during the hours of 8 a.m. and 4:30 p.m.. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on 571-272-1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

  
Sylvia R MacArthur  
Primary Examiner  
Art Unit 1792

November 24, 2007